

REMARKS

In response to the Official Action dated 1/4/2005, the above-identified application has been amended. Review and reconsideration are requested in view of the above amendments and following remarks.

Claims 1 and 7 were objected to for several antecedent basis informalities. Applicant has amended these claims accordingly and believes the claims now overcome the objection thereto. Withdrawal of the objection is therefore respectfully requested.

The examiner rejected claims [1-31] 1-3, 5-11 under 35 U.S.C. § 103(a) as being unpatentable over Clark in view of Hanlon et al. The examiner stated that Clark taught a temperature sensitive transformable material, including a mixture of water, INA microorganism, but lacked latex. The Examiner stated Hanlon et al. disclose a temperature sensitive transformable material which includes a mixture of water, latex, wherein one of latexes is paraffin or wax and an INA agent.

Applicants respectfully traverse. The present invention calls for a critical temperature indicator which provides an irreversible visual indication that the indicator has been exposed to a predetermined critical temperature, which includes:

a transparent housing; and
a temperature sensitive transformable material operably contained within said transparent housing which includes mixture of water, latex, and ice nucleating active (INA) microorganism which is translucent prior to exposure of a predetermined temperature and is transformed upon being subjected to said predetermined temperature to render a substantially consistent opaque

material thus precluding visibility therethrough and thereby providing a sure visual sign that said indicator has been subjected to said predetermined temperature. This is not taught, suggested or disclosed by the references.

Clark does not teach, disclose or suggest an ice nucleating active (INA) microorganism. An INA microorganism is an organism which is used in the present invention to detect a critical descending temperature and triggers an opacifying transformation upon reaching the predetermined descending temperature. Clark on the other hand teaches only of the inclusion of product having a nutrient inoculated with bacteria which multiplies upon reaching a change in pH which is achieved through growth of bacteria in an ascending temperature. Thus, a pH change responsive indicator is provided to bacterial or enzymatic change of the pH produced by the strain of bacteria. Clark teaches producing an acidic media to change color of the indicator. This is contrasted with the present invention which is not pH dependent rather opacity is triggered on reaching a descending temperature wherein the INA microorganism aids to perform this. Clark simply does not disclose any such INA microorganism.

Hanlon et al disclose a nonreversible freeze-thaw indicator (descending temperature indicator) which uses silver iodide crystals as nucleating agents and polymeric resins which form latexes. However, Hanlon et al. do not teach of waxes or paraffins as the examiner states citing Col. 2, lines 36-41. Nor does Hanlon et al. teach of INA microorganisms in conjunction with the latex, and water. The advantage of the present invention is that there is a more accurate critical temperature indicator which can be achieved through the claimed combination, particularly when using D₂O.

It could not have been obvious to one skilled in the art at the time of the invention to have

combined the teachings of Clark with that of Hanlon et al. and arrived at the instant invention. Conversely, the two teach away from each other in that Clark teaches of a pH change indicator though an ascending temperature and Hanlon et al. of a freeze indicator through a descending temperature. Combining the two teachings would not appear to help either and in any case would not provide the instant invention.

Claims 1-3, 5-11 are submitted to be patentably distinct over the art. Accordingly, withdrawal of the rejection of claims 1-3, 5-11 is respectfully requested.

The examiner maintained similar rejections to claims 12-14, 16-24 and 26-31 and applied the same arguments to claims 1-3, 5-11.

For the reasons stated above, the claims 12-14, 16-24 and 26-31 are submitted to be patentably distinct over the art. Accordingly, withdrawal of the rejection of claims 12-14, 16-24 and 26-31 is respectfully requested.

Claims 4, 15 and 25 were said to have disclosed obvious ranges in view of Clark and Hanlon et al. Again, applicants respectfully traverse. Neither of the cited references disclose, teach or suggest of an INA microorganism as called for in the present invention. There can be no be obviousness as to the ranges. Claims 4, 15 and 22 are submitted to be patentably distinct over the art. Accordingly, withdrawal of the rejection of claims 4, 15 and 22 is respectfully requested.

The present invention provides for ice nucleating active (INA) microorganisms, latex and water, preferably D₂O to avoid supercooling effect experienced with using H₂O. The latex becomes irreversibly congealed upon water (preferably D₂O) freezing with the aid of the ice nucleating active (INA) microorganisms to transform the transformable material into an opaque

material. This is not taught, suggested or disclosed in the art. Accordingly, withdrawal of the rejection of the claims is respectfully requested and allowance of the claims is requested at as early a date as possible. This is intended to be complete response to the Official Action dated 1/4/2005.

Respectfully submitted,



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